HUMAN HEALTH MID-CYCLE REVIEW SUBCOMMITTEE

Conference Call Summary
Tuesday, January 9, 2007
1:00 p.m. – 3:00 p.m. Eastern Time

Welcome

Dr. Jim Clark, Exxon-Mobil Corporation, Subcommittee Chair

Dr. Jim Clark, Subcommittee Chair, welcomed the Human Health Mid-Cycle Review Subcommittee members to the conference call and thanked them for taking the time to serve on this Subcommittee. A package was distributed of materials for the mid-cycle review to the members prior to this call. Dr. Clark explained that the primary purpose of this call was to provide an opportunity for Dr. Hugh Tilson, National Program Director (NPD) for Human Health Research to present an overview of the materials in the package and provide an opportunity for the members to pose any questions that came to mind as they reviewed the materials. Dr. Clark mentioned that all of the members of this Subcommittee participated in the Human Health Research Program (HHRP) Review conducted in 2005. He noted that the mid-cycle review is not a full program review, just a review of the progress since the program review and any changes that have been implemented in response to the review. There are five specific charge questions for the mid-cycle review, which were included in the materials sent prior to the call. A list of the Subcommittee members and other participants is attached to this summary, along with the agenda for the conference call.

Administrative Procedures

Virginia Houk, EPA/Office of Research and Development, Designated Federal Officer

Ms. Virginia Houk thanked the Subcommittee members and EPA staff for their efforts to prepare for this conference call. She then reviewed the Federal Advisory Committee Act (FACA) procedures that are required for all Board of Scientific Counselors (BOSC) Subcommittee meetings. As the Designated Federal Officer (DFO) for the Human Health Mid-Cycle Review Subcommittee, Ms. Houk serves as the liaison between the Subcommittee and ORD. She explained that the BOSC is a Federal Advisory Committee that provides independent peer review for EPA's Office of Research and Development (ORD). The BOSC reviews ORD programs every 4 to 5 years, and a mid-cycle review is conducted approximately 2 years following the program review. The purpose of the mid-cycle review is to gauge the progress that has been made and the changes that have been implemented since the program review, and to obtain advice on future directions for the program. The Human Health Mid-Cycle Review Subcommittee is a subset of the Human Health Research Program Review Subcommittee. This is the first conference call for the Human Health Mid-Cycle Review Subcommittee. A face-to-face review meeting will be held on January 24, 2007 in Arlington, Virginia. Following the

meeting, the Subcommittee will prepare a report that will be submitted to the BOSC Executive Committee for review. If another conference call is necessary to finalize the report after the meeting, that call will be advertised in the *Federal Register* as required by FACA rules. The Executive Committee will revise the report as it deems appropriate and submit it to ORD. The rights of decision making on how to respond to the review reside with EPA, and program implementation is the responsibility of the Agency.

Ms. Houk stated that it is her responsibility as the DFO to ensure that the Subcommittee's conference calls and meetings comply with all FACA rules. All meetings and conference calls involving substantive issues, whether in person, by phone, or by e-mail, that include one-half or more of the Subcommittee members must be open to the public and a notice must be placed in the *Federal Register* at least 15 days prior to the call or meeting. Issues that are preparatory or administrative in nature are exempt from this requirement. The Subcommittee Chair and DFO must be present at all conference calls and meetings. The information for this conference call was entered into the federal docket management system (http://www.regulation.gov, Docket ID EPA-HQ-ORD-2006-0978).

During this conference call, items will be discussed according to the agenda, and a summary of the call will be made available to the public after certification by the Chair of the Subcommittee. The Chair must certify the summary within 90 days of the call or meeting. The summary then will be posted on the BOSC Web Site (http://www.epa.gov/osp/bosc).

Ms. Houk has worked with EPA officials to ensure that all appropriate ethics regulations have been satisfied; each Subcommittee member has filed a confidential disclosure form and completed the required ethics training. Dr. Timothy Buckley has informed Ms. Houk about a grant application that he submitted to EPA in response to a Science To Achieve Results (STAR) solicitation. The application, which focuses on asthma effects and ambient air particles, is in review. Dr. Buckley has been asked to recuse himself from any discussions that concern asthma. Because notes were being taken, Ms. Houk asked speakers to identify themselves when making a comment. She reported that no requests for public comment were submitted prior to the call, but the agenda allows time for public comment from 2:50 to 3:00 p.m. She will call for public comments at that time and each comment should be limited to 3 minutes.

Ms. Houk stated that the charge questions are to guide the work of the Subcommittee. They were provided to the Subcommittee by the BOSC Executive Committee and were designed to obtain feedback from the program staff on both management and scientific issues. She mentioned that Phillip Juengst from ORD will provide more information on one of the charge questions. Ms. Houk said that, should the Subcommittee need additional information or materials for the review, she would provide them promptly upon request. She closed her remarks by informing the members that EPA is eagerly awaiting the Subcommittee's advice.

As the Accountability Team Leader for ORD, Mr. Juengst works with programs on development and tracking of program performance measures to assess how well the program is achieving its goals, mission, etc. Mr. Juengst stated that this has been an ongoing challenge for ORD. He explained that a work group was formed, which included representatives from ORD, the BOSC, and the Office of Management and Budget (OMB), to develop some means of qualitatively measuring long-term performance of a research program. This work group has developed a draft rating system that uses consistently defined terminology to assess program performance. Every

4 years, the program review conducted by the BOSC will include a qualitative rating (using the defined terminology) that will be used as a benchmark to assess performance since the previous review and to compare it to other programs. Mr. Juengst commented that the BOSC Executive Committee is expected to give final approval at its next meeting to begin piloting this rating system. A fifth charge question, focused on rating the progress of the program in moving forward, has been added to the Human Health Mid-Cycle Review Subcommittee's charge to capture an element of this new rating tool. The Subcommittee will respond to the fifth question using the defined terminology of the rating system. Mr. Juengst emphasized that this additional question is not intended to alter the BOSC's review process; its purpose is to provide additional information that will be useful to the program in responding to the Program Assessment Rating Tool reviews conducted by OMB.

Dr. Buckley asked if there is any documentation available that describes the pilot rating system. Mr. Juengst responded that the work group has developed a methodology that is several pages in length, which contains the definitions of the rating terms (e.g., satisfactory, exceptional). The BOSC Executive Committee will need to decide if the draft document can be released to the Subcommittee members. Dr. Clark said that he will work with Ms. Houk and Ms. Lorelei Kowalski, the DFO for the Executive Committee, to obtain a copy of the draft document. He mentioned that the work group has a conference call tomorrow to discuss the rating tool. Dr. Tilson stated that the draft rating tool was to be included in the package that was sent to the members before the call, but because OMB had some comments on the draft, it was removed from the package. Dr. Clark commented that after tomorrow's work group call, he will work with the DFOs to obtain the document for the Subcommittee.

Human Health Research Program
Dr. Hugh Tilson, EPA/ORD, National Program Director for Human Health Research

Dr. Tilson stated that the purpose of the mid-cycle review is to elicit feedback from the Subcommittee on: (1) the progress made on implementing the action items identified in ORD's response to the 2005 program review, (2) emerging issues that have arisen since the program review (e.g., Program Assessment Rating Tool [PART] review, revision of the Multi-Year Plan [MYP]), and (3) the proposed expansion of the research for Long-Term Goal (LTG) 4.

The face-to-face meeting for the HHRP review was held February 28-March 2, 2005. The review report was submitted to ORD in July 2005 and ORD prepared a response to the review, which was presented to the BOSC at the September 2005 Executive Committee meeting. ORD's response included a number of action items to be taken by the program as well as a time table for implementing the changes.

In preparing the package for this mid-cycle review, the program staff prepared a narrative that explained what had been done on each action item. The narrative was organized by LTG, which differed from the organization in the ORD response from September 2005. Since the program review, the MYP has been updated; a copy of the revised MYP was included in the package distributed before this call. Dr. Tilson noted that the revised MYP was approved in June 2006. Also included in the package was a proposal for expanding research under LTG 4.

Dr. Tilson reviewed the outline for his presentation, which included an overview of the HHRP, a summary of the BOSC review of the HHRP in 2005, a summary of the MYP revision, a

summary of the PART review by OMB, an update on LTG 4, and the draft charge questions for the mid-cycle review.

Dr. Tilson explained that the HHRP resides in ORD and the research is performed by four laboratories/centers: National Exposure Research Laboratory (NERL), National Health and Environmental Effects Research Laboratory (NHEERL), National Risk Management Research Laboratory (NRMRL), and National Center for Environmental Research (NCER). The major difference since the program review is that in 2005, the National Center for Environmental Assessment (NCEA) was conducting risk assessment/characterization research. As a result of a reorganization, NCEA no longer conducts laboratory research. Dr. Tilson stated that there are three arms of EPA—the program offices, the regions, and ORD. These three arms interact to achieve the Agency's mission of protecting human health and safeguarding the natural environment upon which life depends.

Dr. Tilson provided some data on the personnel and funding of the HHRP. In Fiscal Year 2006 (FY06), there were 194.2 science and administrative positions, including 142.0 science positions (79.0 NHEERL, 47.7 NERL, 7.9 NRMRL, and 7.4 NCER), in the HHRP. The total program budget, including salaries, in FY06 was $61.8 million, of which $12,477,200 was non-STAR research resources and $18,584,900 was STAR research resources.

There are a number of other ORD programs that include a human health component, including the Human Health Risk Assessment, Particulate Matter, Air Toxics, Drinking Water, Endocrine Disruptors, Safe Pesticides/Safe Products, and Homeland Security programs. To differentiate the HHRP from these other programs, Dr. Tilson stated that they have made a concerted effort to focus the definition of the program and make it more outcome-oriented. The HHRP develops and evaluates methods, models, and data to:

- Save lives and protect public health through improved risk assessment by reducing uncertainty in extrapolations necessary for risk assessment:
  - High to low dose
  - Interspecies
  - Dosimetry
  - Single to multiple chemical/pathway
  - Intraspecies variability
  - Exposure assessment
  - Susceptible subpopulations

- Provide the scientific foundation needed for regulatory decision-making.

The HHRP cross-cuts and contributes to a number of other research programs, including the Human Health Risk Assessment, Particulate Matter, Air Toxics, Drinking Water, Endocrine Disruptors, Safe Pesticides/Safe Products, and Computational Toxicology programs. Dr. Tilson stated that the HHRP provides mechanistic information to the Drinking Water and Safe Pesticides/Safe Products programs, mechanisms of action for the Air Toxics and Particulate Matter programs, risk assessment information for the Human Health Risk Assessment Program, and data for model development for the Computational Toxicology Program. HHRP's work on characterizing cumulative risk and risks to susceptible populations cut across a number of

programs; the HHRP contributes basic information that is used by these problem-driven programs.

Dr. Tilson identified the four LTGs of the HHRP that are defined in the revised MYP:

LTG 1: Risk assessors/managers use ORD's methods, models, and data to reduce uncertainty in risk assessment using mechanistic (or mode of action) information.

LTG 2: risk assessors/managers use ORD's methods, models, and data to characterize aggregate and cumulative risk assessment.

LTG 3: Risk assessors/managers use ORD's methods, models, and data to characterize and provide adequate protection for susceptible subpopulations.

LTG 4: Risk assessors/managers use ORD's methods and models to evaluate risk management decisions.

The LTGs were crafted using outcomes-oriented language—there is an action in each LTG. The LTGs are driven from the top down by the EPA Strategic Plan; however, the projects defined to address these LTGs were developed through discussions with stakeholders and program scientists.

Dr. Tilson mentioned that Table 3 in the package of materials that was distributed to the Subcommittee provides a cross-walk of the scientific questions and research themes or research tracks in which the HHRP is engaged. It shows how the HHRP has been constructed. He explained that the MYP identifies, for each LTG, the scientific questions, research themes or tracks, and the group of projects to address the themes. Dr. Tilson then identified the scientific questions to be addressed and the research themes for each LTG.

For LTG 1, use of mechanistic information in risk assessment, the scientific questions are:

- What methods/models are needed to identify modes or mechanisms of action that can be used for risk assessment?

- How can knowledge of key biological events (i.e., toxicity pathways) inform the development of integrated pharmacokinetic/pharmacodynamic models for risk assessment and lead to a systems biology approach for risk assessment?

- How can knowledge of toxicity pathways be used to reduce uncertainty in exposure/dose response extrapolation in risk assessment?

Dr. Tilson noted that this last question was added in the revised MYP.

The three research themes in LTG 1 are:

- Provide a framework for using genomic and toxicological data to identify key events in toxicity for prioritization.

- Develop physiologically based pharmacokinetic (PBPK) linkages for risk assessment (e.g., arsenic, halogenated drinking water contaminants, nuclear receptor activating compounds).

- Conduct research to provide mechanistic information to evaluate risk for high priority chemicals or classes (e.g., arsenic, conazoles, halogenated drinking water contaminants, particulate matter, neuroendocrine disruptors).

For LTG 2, characterizing aggregate and cumulative risk, the scientific questions to be addressed are:

- What biomarkers are available to improve cumulative risk assessment?

- What exposure models are available that can estimate aggregate and cumulative exposures?

- How can mode of action and exposure information be used to conduct cumulative risk assessments?

- How can cumulative risk be assessed at the community level?

The four research themes in LTG 2 are:

- Biomarkers of exposure for cumulative risk.
  - Methods to characterize biomarkers of exposure.
  - Reconstructing individual exposures from biomarker data.
  - Assessing intra- and interpersonal variability of biomarker measurements.
  - Guidelines for collection of biomarkers for future studies.
  - Cumulative risk of pyrethroid pesticides.

- Linking exposure and dose models for cumulative risk.

- Research on mixtures of carbamates and pyrethroids.

- Research on impact of multiple stressors-community risk.

Dr. Tilson stated that the area of biomarkers has become a growth area since the program review. The program also is heavily involved in development of exposure models and is conducting research on the impact of multiple stressors.

For LTG 3, susceptible subpopulations, the scientific questions to be addressed are:

- Is there differential life-stage response or exposure to environmental agents?

- What biological factors are present as a function of life-stage that could be used to determine susceptibility or vulnerability to environmental agents?

- How does life-stage influence the origin or exacerbation of environmentally related diseases such as asthma?

The four research themes in LTG 3 are:

- Long-term effects of developmental exposure to environmental agents.

- Life-stage factors associated with differential responsiveness.
  - Pharmacokinetic and pharmacodynamic factors
  - Exposure patterns
  - Mitigation approaches for children's exposure and effects assessment in longitudinal studies.
  - Research on long-term effects of *in utero* exposure to air pollutants and role of molds on development of asthma.

- Refining tools to support children's exposure and effects assessment in longitudinal studies.

- Research on long-term effects of *in utero* exposure to air pollutants and role of molds on development of asthma.

Dr. Tilson stated that this area was somewhat unfocused in the 2005 program review. It now is focused on life-stage and how life-stage is considered in EPA risk assessments. He mentioned that the third theme (i.e., refining tools to support children's exposure and effects assessment) is the residual of the National Children's Study.

For LTG 4, evaluation of risk management decisions, the scientific questions to be addressed are:

- What are the trends in health status in the United States?

- What approaches are available to establish the basis for evaluating changes in human health following risk management decisions?

The two research themes in LTG 4 are:

- Report on the Environment

- Demonstration projects
  - Assess impact of drinking water regulations related to microbial pathogens.
  - Assess cumulative impact of air pollution reduction programs on environmental public health indicators for children and older individuals.

Dr. Tilson commented that LTG 4 was called public health outcomes in the 2005 program review.

Before moving to the next topic of his presentation, Dr. Tilson asked if there were any questions. Dr. Clark said that he found the materials prepared for the review to be very helpful in identifying the areas where ORD was conducting human health research projects. He asked about the focus on asthma rather than diabetes or other diseases. Is asthma an EPA priority? Dr. Tilson responded that the Office of Air and Radiation (OAR) has been interested in asthma; the Office of Indoor Air also has an interest in how exposure to fungi and mold relates to asthma. The regional offices also have some interest in the indoor air environment and asthma.

Dr. Joseph Landolph asked if EPA had done much work on perfluorooctanoic acid (PFOA) and similar derivatives. Dr. Tilson replied in the affirmative, stating that it is one of the classes used in development studies in LTG 3. Dr. Landolph asked if the studies have included reproductive toxicity and bioaccumulation. Dr. Tilson responded that the primary focus of the studies has been reproductive toxicity.

Dr. Tilson presented a timeline for the BOSC review of the HHRP in 2005. The face-to-face review meeting was conducted February 28-March 2, 2005. The BOSC transmitted the final report to ORD on August 5, 2005. A briefing on the response to the report was presented to the BOSC Executive Committee on September 13, 2005. The face-to-face meeting for the mid-cycle review is scheduled for January 24, 2007.

The 2005 BOSC program review report contained seven sections—an executive summary, overview comments, a section for each LTG, and testimonials. ORD identified 27 action items as they occurred in each section of the BOSC report and developed a table with timelines that contained two basic items: (1) specific recommendations (e.g., MYP needs to be revised), and (2) comments (e.g., there needs to be greater communication between the intra- and extramural programs). Unlike the ORD response presented to the BOSC in September 2005, in the mid-cycle review materials, the action items have been organized by LTG, to the extent possible. This organization did not work for all items because some were specific to the executive summary or overview. Dr. Tilson also noted that some items appeared in the BOSC report more than once.

Rather than list all 27 action items in his presentation, Dr. Tilson focused on the following five major action items identified in the 2005 BOSC report:

- Revise the MYP.
  - Provide better conceptual framework.
  - Articulate public health benefits.
  - Develop strategies to manage risk for new chemicals.
  - Broaden scope beyond pesticides.
  - Increase stakeholder involvement in planning and prioritization.
  - Include community-based participatory research.
  - Include pharmacodynamic component to source-effect research.

- Improve integration between parts of the program.

- Improve communication/interactions.
  - Outside the Agency
  - Between intramural and extramural programs
  - With stakeholders (Office of Pesticide Programs, Office of Air and Radiation, Office of Indoor Air)
  - Scientist-to-scientist meetings

- Move forward with LTG 4-evaluation of Public Health Outcomes.

- Conduct bibliometric analysis.

Dr. Tilson commented that the MYP that was reviewed for the 2005 program review was prepared in 2003. The revised MYP addresses many comments from the 2005 BOSC review. He noted that the new MYP provides a better conceptual framework and the public health benefits are more apparent. In the revised plan, the program will be using genomic and proteomic approaches for prioritizing chemicals for screening, and a variety of chemical classes are included (e.g., pesticides, disinfection byproducts, particulate matter). Stakeholders and program scientists provided significant input for the revised MYP, and the program includes community-based participatory research, primarily through the STAR program. A pharmacodynamic component was added to the source-effect research.

Integration between parts of the HHRP has been improved with a focus on the risk assessment paradigm. Integration has been difficult because ORD is organized by laboratories and centers, each of which has its own interests and sphere of influence. With respect to communication, Dr. Tilson noted that Donna Roa, ORD's Public Affairs and Science Communication Director, will present a communication pilot, which includes a Web site and material that can be used to discuss the HHRP with those outside the Agency. He mentioned that there is a table in the package of materials that describes workshops at which intramural and extramural researchers have the opportunity to meet and discuss their research and future directions.

Dr. Tilson stated that the program has developed a proposal to move forward on LTG 4 with a specific focus, and the description of LTG 4 was revised. A bibliometric analysis of the program's publications was conducted in April 18, 2005, and a recent analysis was completed in December 2006; this report can be distributed to the Subcommittee members upon request. Dr. Clark indicated that the Subcommittee members would like to receive the most recent bibliometric analysis, and Dr. Tilson agreed to provide it to Ms. Houk for distribution to the Subcommittee.

Dr. Tilson asked if there were any questions. Dr. Landolph asked if the program had any overarching projects examining pesticides and neurodegenerative diseases. Dr. Tilson replied that some years ago, ORD was interested in pesticides and Parkinson's Disease. Feedback from the divisional review, however, indicated that although this was relatively important, the laboratory did not have the resources to adequately pursue the topic given all of its other responsibilities and priorities. He noted that the National Institutes of Health has more resources to devote to such research. Dr. Tilson mentioned that ORD also has had significant interest in autism and exposure.

Dr. Andrew Geller stated that the HHRP research on susceptible subpopulations, specifically older adults, looks at cardiovascular disease and central nervous system changes; this research, however, has not been linked to exposures and neurodegenerative diseases. He noted that the STAR Program funds some projects on environmental exposure and autism and neurodegenerative disease. Dr. Buckley asked if ORD has revised the HHRP in response to the 2005 program review or just submitted a response to the review. Dr. Tilson answered that substantial consideration was given to the review comments when the MYP was revised. He noted that the MYP guides the direction of the HHRP. Dr. Buckley asked if the revised MYP had been distributed to the Subcommittee, and Dr. Tilson replied that it was in the package. Dr. Buckley then asked if the members can see the manifestation of ORD's response in the revised MYP, and Dr. Tilson replied in the affirmative. The revisions made to the plan directly respond

to the recommendations of the 2005 program review. Dr. Geller noted that the revised MYP clearly shows the linkages between the LTGs and the relationship between this MYP and other MYPs that guide human health research at EPA.

Dr. Landolph mentioned the flood of nanoparticles in the environment and asked if the program has given any thought to moving into computational toxicology. Dr. Tilson responded that ORD has a nanotechnology research program and is developing an MYP for the program. There is not a significant human health component in that program at this time. He noted that much of EPA's nanotechnology work has been extramural and added that a number of other agencies are involved in nanotechnology research. Dr. Tilson also mentioned that ORD has created a new National Center for Computational Toxicology (NCCT). The HHRP develops methods and data that feed into the NCCT for the development of models. Dr. Landolph asked if there currently is a specific project on nanotechnology. Dr. Clark commented that Attachment C in the MYP is very useful, and he suggested that Dr. Landolph look at the cross-walk to see if there are any items related to nanotechnology. Dr. Tilson mentioned that he meets quarterly with the NCCT Director to discuss mutual interests and projects. The Annual Performance Measures (APMs) and Annual Performance Goals (APGs) in the MYP are derived from those discussions. He noted that NCCT is working with HHRP researchers to model arsenic data using computational toxicology approaches.

In the 2005 program review, the BOSC recommended that ORD revise the MYP for the HHRP. ORD solicited input from stakeholders and ORD researchers, obtained input from the program and regional offices (see Attachment B in the MYP), formed writing teams to develop the issues raised by the stakeholders, and then drafted the revised MYP. He noted that the PART review indicated that the LTGs should be outcome-based (systematic evaluation of how outputs are used for risk assessment). The two performance metrics identified in the PART review are: (1) bibliometric analysis, and (2) the tracking of how products are used by risk assessors/risk managers. He also mentioned that certain items were deleted from the program in the revised MYP because of the budget changes from FY06 to FY08.

Dr. Tilson summarized the MYP revisions as follows:

- The revised MYP contains outcome-oriented LTGs.

- The revised MYP focuses on addressing extrapolation issues in risk assessment.
  - Deemphasizes aggregate risk.
  - Increases emphasis on biomarkers.
  - Includes community risk as a new theme.
  - Susceptible subpopulation LTG focuses on life-stage.
  - Deemphasizes the National Children's Study.
  - Evolution of theme to evaluate risk management decisions.

- Cross-linkages to stakeholder needs.

- Cross-linkages to other MYPs.

Dr. Tilson noted that the program has disinvested in a number of areas that were not focused on life-stage issues; the National Children's Study also has been de-emphasized.

Dr. Tilson reported that the HHRP received a rating of "adequate" on its PART review by OMB. The review found that the program had an unambiguous, focused design; no evidence of major flaws; and meaningful annual and long-term performance measures. The review also found that the results are being used to reduce uncertainty in risk assessment. The performance metrics developed for future PART reviews include:

- Long-term outcomes (through external expert review and documentation of use of products).
- Annual output measures.
- Four-year cycle outcome—bibliometric analysis.
- Annual efficiency measure—time to process grants.
- Annual client survey being developed.

Dr. Tilson noted that these metrics are focused on how the research products and publications are being used by risk managers and risk assessors and how the research is being used to inform the uncertainty in the risk assessment process. He mentioned that there were challenges in establishing baselines for performance metrics. A summary of the metrics is provided in Table 4 in the package. The program now has a toolbox of performance metrics; some of which are long term and others are short term. The program is relying on external expert review to assess progress over time, including some consistent qualitative measures. The program also is considering the use of an annual client survey to solicit stakeholder feedback.

With regards to LTG 4, Dr. Tilson stated that this goal has been redefined since the 2005 program review. A steering committee was formed on October 16, 2006, and a working group was established to develop a framework document for the research. This document will be used as a springboard for discussions with scientists at a scientist-to-scientist meeting that is planned for spring 2007. The outcome of this meeting will be an implementation plan for the expanded research, and this plan should be developed by fall 2007.

At a meeting of ORD's Executive Council in December 2006, the NPDs were asked to develop strategic directions for their programs for the next 5 years. The Human Health Research Coordination Team (RCT) spent considerable time discussing this topic. Accountability was identified as an important direction. It was targeted by the PART review as an area that needed to be further developed, and ORD senior management is supportive of more research on accountability.

Dr. Tilson presented a diagram of the strategic direction for the future of the HHRP. The current focus of the program (left side of the diagram) is reducing uncertainties in risk assessment (mechanistic information, cumulative risk, susceptible subpopulations, and evaluation of risk management decisions). The future focus of the program (right side of the diagram) will be: (1) developing and linking indicators of risk (valid indicators—chemical/nonchemical stressors, susceptible subpopulations, cumulative risks), and (2) linking indicators with health measures as an approach for evaluating risk management decisions. This will address issues raised in the Report on the Environment. Dr. Tilson noted that the report indicated that biomonitoring data do not provide information about exposure or source—there is no particular connection between biomonitoring data and health effects. There also are data on incidence in populations but there is no connection to biomarkers or bioindicators. Links between exposures and health effects are needed as well as valid indicators. ORD and EPA are moving to do more in this area and the

HHRP can contribute. The program can be used to identify valid indicators that can be used in making risk management decisions, and the program can address some of the questions raised in the Report on the Environment.

Dr. Tilson closed his presentation by reviewing the draft charge questions for the mid-cycle review of the HHRP:

- How responsive has the program been to the recommendations from the 2005 program review?
- How clear is the rationale in the revised MYP for the program?
- How meaningful are the performance metrics as indicators of impact?
- What advice can the BOSC provide concerning the emerging research area to evaluate risk management decisions (LTG 4)?
- Is the HHRP making exceptional, satisfactory, or unsatisfactory progress in moving the program forward in response to the 2005 BOSC review?

Dr. Tilson commented that the revised MYP is somewhat lengthy but he thought the detail about the program was needed to ensure that the program offices understand what ORD plans to do in the HHRP.

Dr. Elaine Symanski noted that one performance metric is to track how the program's products are used by risk assessors and risk managers. In the OMB program review, ORD documented the use of data in risk assessments. Is there a plan to gather data on how risk assessments have informed Agency risk management decisions? Dr. Tilson responded that ORD is struggling with documenting how its products are being used. He noted that ORD tried to demonstrate to OMB in the HHRP PART review how the program's products are being used by risk managers and risk assessors. The Integrated Risk Information System (IRIS) provides a convenient place to start on gathering information on how the products are being used. There also are some examples of how the program's products have been used in risk management decisions to mitigate indoor air problems. It is evident that it is difficult to capture this information. Dr. Tilson stated that ORD is working on better ways to provide its research products to its customers and ways to capture information on how those products are being used. He pointed out that this problem is not unique to the HHRP.

Dr. Clark mentioned that the MYP did not identify the HHRP as a core research program, as opposed to a problem-driven program. Dr. Tilson replied that the MYP makes it clear that the HHRP involves more fundamental research and it feeds into a number of problem-driven research programs. He noted that terminology is an issue at EPA; there has been some discussion about whether EPA needs a basic research program.

Dr. Landolph asked if there is a list of priorities that must be addressed by the program. Dr. Tilson responded that each group has a "hit list" that is based on the needs of the program offices. He mentioned that these lists change as priorities change; the lists are kept up to date

through interactions with the program offices. He noted that IRIS can be used to identify chemical classes that are important.

Dr. Landolph asked about the difficulty of shifting money from one area to another or from one chemical to another. Dr. Tilson answered that it is easier to do so for some areas than others. It was relatively easy, for example, for the brominated diphenyl ethers because of the existing dioxin program; when the regions had questions about a risk assessment on this class of chemicals, ORD was able to shift resources and start to study effects and exposure to the brominated diphenyl ethers. It is more difficult to shift resources to address something that is completely new. He noted that there is a re-emerging interest in ozone, a chemical that was studied and then ORD disinvested itself; the program now is struggling with how to retool to address ozone.

Dr. Landolph stated that during the 2005 program review, the Subcommittee discussed the desirability of EPA training a new generation of environmental leaders. Has the program been able to hold onto its senior staff long enough to train new researchers? Dr. Tilson responded that there are a number of post-docs involved with the program and they are being trained in the laboratories/centers conducting the research; each post-doc has been assigned a mentor. He mentioned that each laboratory/center uses post-docs differently. In some cases the post-docs are trained to take the place of more senior staff; in other situations, they are not considered potential replacements. He noted that many young researchers are being trained through the fellowship program.

Dr. Symanski asked about the charge to the steering committee for redefining LTG 4. Was the steering committee asked to provide guidance for prioritizing when risk management decisions would be evaluated? Did the charge address developing benchmarks of measuring effectiveness? Dr. Tilson responded that it would be similar to the other three LTGs. ORD would look at how the program's products are being used by others within the Agency. ORD also would look for how the products are being used in localized regulatory decisions. Dr. Tilson said that his greatest hope for LTG 4 is that the regional offices will be fully equipped and aware of the need to determine whether their decisions are having an effect. ORD could learn a great deal from such information.

Public Comment

The discussion was paused at 2:50 p.m. for public comment. Ms. Houk asked if anyone present wanted to make a comment. When no comments were offered, the discussion resumed.

Discussion of Dr. Tilson's Presentation on the HHRP

Dr. Clark thanked Dr. Tilson for providing the Subcommittee the information needed to conduct the review and for his very informative presentation. The face-to-face meeting will be held in Arlington, Virginia, on January 24, 2007. The agenda for the meeting will be organized around the charge questions. Dr. Tilson will attend the meeting and provide a brief overview of the changes made by the program since the 2005 program review. Dr. Clark envisioned this to be a 5-10 minute summary with an opportunity for the Subcommittee members to pose any questions they might have after reviewing the materials and listening to the presentation. Dr. Clark has assigned a lead for each charge question. These individuals will be asked to lead the discussion

for their assigned charge questions. There will be time on the agenda for the Subcommittee to discuss their responses to the charge questions and to consolidate their thoughts and advice. Dr. Clark said he hopes to have a draft report completed by the end of the day.

Dr. Tilson asked about what he should present at the fact-to-face meeting. Should he provide different or additional materials at the meeting? He was concerned that his presentation would be redundant to this one and he did not want to waste the Subcommittee members' time. Dr. Clark replied that he was not necessarily expecting new material for the January 24 meeting; perhaps Dr. Tilson could provide clarifications as needed and address the program's capability of handling new ideas.

Dr. Landolph asked Dr. Clark to review the charge question assignments. The assignments are as follows:

Charge Question #1: Joseph Landolph
Charge Question #2: Jim Clark
Charge Question #3: Timothy Buckley
Charge Question #4: Elaine Symanski
Charge Question #5: Jim Clark

Dr. Clark noted that each member will be expected to prepare written comments on all of the charge questions; the member assigned to lead the charge question, will be responsible for leading the discussion for that question. He asked the Subcommittee members to send their written comments to Ms. Houk, who will distribute them to the appropriate lead. Dr. Clark mentioned that charge question #5 is the new question that involves the use of standard terminology as defined by the rating tool work group.

Dr. Tilson asked that the members notify Ms. Houk if there are specific issues that they would like him to clarify at the January 24 meeting. Dr. Clark reminded the members to work with Ms. Houk to make their travel arrangements and hotel reservations. Ms. Houk asked Dr. Clark if it was his intention to have the Subcommittee members come to the meeting with a draft of their responses to the questions. Dr. Clark confirmed that was his intention. Dr. Landolph asked about the length of the responses of the individual members. Should they be about one page? Dr. Clark replied that the final report should be approximately 5-10 pages, so he thought a 1-2 page individual response was appropriate. He pointed out that the members will have to work through any contradictory statements among the responses and reach consensus.

Dr. Tilson agreed to send the updated bibliometric analysis to Ms. Houk for distribution to the Subcommittee members. Dr. Clark and Ms. Houk will work with Ms. Kowalski to obtain a copy of the draft document on the rating tool for distribution to the Subcommittee. Dr. Clark concluded the conference call at 3:00 p.m. by stating that he looked forward to working with everyone at the January 24 meeting. The call was concluded at 3:00 p.m.

Action Items

- ✍ Each member should prepare a written summary of comments for all charge questions and submit it to Ms. Houk prior to the January 24 meeting.

- ✍ Ms. Houk will distribute the members' comments on the charge questions to the assigned lead for each charge question prior to the January 24 meeting.

- ✍ The assigned lead for each charge question should be prepared to lead the discussion for that question at the January 24 meeting.

- ✍ Subcommittee members who would like clarification on an issue from Dr. Tilson at the January 24 meeting should submit the request to Ms. Houk, who will notify Dr. Tilson.

- ✍ Requests for additional materials for the review should be submitted to Ms. Houk, who will distribute the requested items to the members.

- ✍ Subcommittee members should contact Ms. Houk about making their travel and hotel arrangements for the January 24 meeting in Arlington, Virginia.

- ✍ Dr. Tilson will send the updated bibliometric analysis to Ms. Houk, who will distribute it to the Subcommittee members.

- ✍ Dr. Clark and Ms. Houk will work with Ms. Kowalski to obtain a copy of the draft document on the rating tool for distribution to the Subcommittee.

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APPENDIX A: Teleconference Agenda

HUMAN HEALTH MID-CYCLE TELECONFERENCE MEETING AGENDA
January 9, 2007
1:00 p.m. – 3:00 p.m.

Tuesday, January 9, 2007

1:00-1:05 p.m.	Welcome - Introduction of Subcommittee Members - Overview of Subcommittee Objectives and Purpose	Dr. Jim Clark Chair, HH Mid-Cycle Subcommittee
1:05-1:30 p.m.	Administrative Procedures - FACA Rules	Virginia Houk (EPA) DFO, HH Mid-Cycle Subcommittee
	- The Charge	Phillip Juengst (EPA) ORD/ORMA
1:30-2:40 p.m.	Human Health Research Program (HHRP) - Explanation of Documentation - Overview of the Program - Summary of the Findings of the BOSC Review of 2005 - Summary of the Multi-Year Plan Revision - Summary of PART Review by OMB - Update on LTG 4: Research to Evaluate Risk Management Decisions - Draft Charge Questions - Discussion	Dr. Hugh Tilson (EPA) National Program Director for HHRP HH Mid-Cycle Subcommittee
2:40-2:50 p.m.	Preparation for Face-to-Face Meeting	Dr. Jim Clark and HH Mid-Cycle Subcommittee
2:50-3:00 p.m.	Public Comments	
3:00 p.m.	Adjourn	